

## AND FOR HYDROGEN PRODUCTION

## ABSTRACT

5 This invention provides new compositions, methods for making these compositions, and methods of using the compositions in a variety of energy-related applications. These compositions are useful as electrode materials in devices such as batteries, capacitors, fuel cells and similar devices as also in the direct production of hydrogen and oxygen gas. The new compositions of the present invention comprise: (A) one or more of the transition metal elements; 10 optionally (B) aluminum; optionally (C) one or more of the group 1A alkali metal elements; (D) one or more elements and/or compounds having high mobility values for electrons; and (E) a source of ionizing radiation. Thus, components A, D and E are required ingredients of the present invention, and components B and C are both optional. Components B and C may be used independently alone, 15 together, or not at all.

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